

Case 2898

***Scomber dentex* Bloch & Schneider, 1801 (currently *Caranx* or *Pseudocaranx dentex*) and *Caranx lugubris* Poey, [1860]
(Osteichthyes, Perciformes): proposed conservation of the specific names**

William F. Smith-Vaniz

*U.S. Department of the Interior, National Biological Survey,
Southeastern Biological Science Center, 7920 N.W. 71st Street, Gainesville,
Florida 32653, U.S.A.*

John E. Randall

Bernice P. Bishop Museum, Box 19000-A, Honolulu, Hawaii 96817, U.S.A.

Abstract. The purpose of this application is to conserve the specific names of the white trevally *Scomber* (now *Caranx* or *Pseudocaranx*) *dentex* Bloch & Schneider, 1801 and the black jack *Caranx lugubris* Poey, [1860] (family CARANGIDAE). *Scomber glaucus* Linnaeus, 1758 is a composite species which is an unused senior synonym of both *S. dentex* (the type species of *Pseudocaranx* Bleeker, 1863) and *Gasterosteus* (now *Trachinotus*) *ovatus* Linnaeus, 1758; suppression of *glaucus* is proposed. It is also proposed that the widely used name *Caranx lugubris* be conserved by the suppression of the senior synonym *C. ascensionis* Cuvier in Cuvier & Valenciennes, 1833. '*Scomber adscensionis* Osbeck, 1771' is formally unavailable but has been used for the species now referred to as *C. dentex* and, in error, to that referred to as *C. lugubris*; it is proposed that the name '*adscensionis*' also be placed on the Official Index. *C. ascensionis* Cuvier is currently almost universally regarded as an invalid junior secondary homonym of '*C. adscensionis* (Osbeck)'. *Caranx* (or *Pseudocaranx*) *dentex* is a widely distributed species from the subtropics and edges of the tropics in the Atlantic and Indo-Pacific; *C. lugubris* is a circumglobal tropical species. Both *dentex* and *lugubris* are commercially valuable food species.

1. In 1758 Linnaeus (p. 298) described the nominal species *Scomber glaucus* and referred to the descriptions of two previous authors. The sources were *Scomber adscensionis* Osbeck, 1757 (p. 296) and a description by Artedi (1738) in the third (p. 32) and fourth parts (pp. 51–52) of his *Ichthyologia*. Translations of Osbeck's Swedish work appeared in 1765 (a German version by J.G. Georgi) and 1771 (an English version by J.R. Forster which was a translation from the German). Linnaeus's name *glaucus* was used in both the (1765) and (1771) translations but '*adscensionis* Osbeck' appeared (p. 94) as a synonym in a footnote in the latter, and has been adopted by many subsequent authors as '*Caranx adscensionis* (Osbeck, 1771)'. However, Osbeck's name is pre-Linnaean and is therefore not available from either 1757 or 1771 (Articles 11a and 11e(i) of the Code). Wheeler (1963, p. 533) noted that Osbeck's description left little doubt that '*Scomber adscensionis*' was a

species of *Caranx* for which the type locality was the island of Ascension in the mid-south Atlantic. In relation to Artedi's account, Wheeler noted that this referred to a species of *Trachinotus* and wrote 'it is highly probable that it refers to the *Trachinotus glaucus* of authors' (now known as *T. ovatus* (Linnaeus, 1758) or *T. goodei* Jordan & Evermann, 1896; see para. 6 below). Wheeler (1963, p. 534) further noted that Linnaeus himself (1764, p. 89) considered the name *Scomber glaucus* to apply to a carangid fish with the posterior lateral line armoured with scutes.

2. A second carangid fish with scutes was described from Ascension Island by Cuvier in Cuvier and Valenciennes, 1833 as *Caranx ascensionis* (p. 102, fig. 249), based on a specimen collected by Quoy and Gaimard, a description of *Scomber glaucus* Linnaeus in Bloch & Schneider (1801, p. 33) (see para. 5), and on a copy made by Sarah Bowdich of G. Forster's unpublished drawing labeled '*Scomber ascensionis*'. Perhaps for this reason Cuvier attributed the name to Forster but the description is Cuvier's and the nominal species should be attributed to him. Cuvier noted that his taxon was distinct from the *adscensionis* described by Osbeck (1757). Streets (1877, p. 88) listed *Caranx ascensionis* Cuvier in his synonymy under the heading '*Carangus ascensionis* (Forst.)', while Günther (1880, pp. 4, 5) and Seale (1901, p. 73) used the citation '*Caranx ascensionis* (Forst.)'.

3. Osbeck's (1757) description of *Scomber adscensionis* was not very detailed and no type material is known. The high number of dorsal and anal fin rays (in translation, 1771: 'the first dorsal-fin has seven, the second twenty-five ... the anal-fin twenty-five, rays') would eliminate *Caranx ascensionis* Cuvier as a likely candidate for its identity. One of us (W.F. S.-V.) has examined numerous specimens of Cuvier's species; these have 20–22 dorsal and 16–19 anal fin rays. Osbeck (in translation) had stated of his *adscensionis*: 'the body is narrow, grey at the top, white below, about a foot long ... the mouth oblong ... the teeth small'. None of these characters applies to Cuvier's *ascensionis*. However, Osbeck's description agrees well with another carangid locally abundant at Ascension that Bloch & Schneider (1801, p. 30) described from Brazil as *Scomber dentex*. The original description and a photograph of the holotype (catalogue no. ZMB 14112 in the Humboldt Museum in Berlin), kindly provided by Dr H.-J. Paepke, leave no doubt as to the identity of *S. dentex*. Sixteen junior names (a list of which is held by the Commission Secretariat) have been proposed for this commercially important and broadly distributed antitropical species but it has usually been referred to as *Caranx* (or *Pseudocaranx*) *dentex* in recent works. Examples of usage of this name are Barnard (1927, p. 546), Hureau & Monod (1973), Smith-Vaniz & Berry (1978), Smith-Vaniz, Bauchot & Desoutter (1979, p. 6), Gushiken (1983), Masuda et al. (1984), Seki (1984), Smith-Vaniz (1984, 1986a, 1986b), Smith & Heemstra (1986, p. 654), Edwards & Glass (1987, p. 1380), Paxton, Hoese, Allen & Hanley (1989, p. 582), Randall, Smith & Feinberg (1990, p. 20) and Yamaoka, Han & Taniguchi (1992). *Scomber dentex* Bloch & Schneider, 1801 is the type species by monotypy of *Pseudocaranx* Bleeker, 1863 (p. 82).

4. Wheeler (1963) used the name *Scomber glaucus* Linnaeus, 1758 as a senior synonym of '*Caranx adscensionis* (Osbeck, 1771)', and did not mention *S. dentex* Bloch & Schneider. He stated that *adscensionis* had been accepted by many authors (he listed four references) for a widely distributed southern Atlantic carangid. We have found eight references in which Osbeck's name was used rather than *dentex*:

Cuvier & Valenciennes (1833, p. 103), Fowler (1936, pp. 693, 699), Lozano y Rey (1952), Albuquerque (1954), Blanc & Bauchot (1961, pp. 489, fig. 8), Smith (1965), Smith & Smith (1966), and Blache, Cadenat & Stauch (1970, p. 312). In the following eight references the authors applied Osbeck's name, most using the combination '*Caranx ascensionis* [sic] (Osbeck)', to the other carangid fish from Ascension that Cuvier (1833, p. 102) named *C. ascensionis* (now widely known as *Caranx lugubris* Poey, [1860]; see para. 7 below): Clark (1915, p. 385), Fowler (1925, 1927, 1928, 1931), Fowler & Ball (1925), Schultz (1943, pp. 86, 88–89) and Harry (1953, p. 128). Additional confusion was introduced by Fowler (1949, p. 77) whose synonymy for '*Caranx ascensionis* (Osbeck)' included references that apply to both *dentex* and *lugubris*. Under the heading *Caranx ascensionis*, Günther (1860, p. 432; 1876, p. 132, pl. 85) had listed '?*Scomber ascensionis* Osbeck' and '*Caranx ascensionis* Forst.' and 'Cuv. & Val.'.

5. Further difficulty was created by Bloch & Schneider (1801, p. 33) in their description of *Scomber glaucus* Linnaeus which included the following statement: 'Ab hoc utroque, si vere idem est, diversum facit Scombrum Adscensionis ab Osbeckio descriptum p. 387 quem Linnaeus cum glaucō conjunxit, J.R. Forster Ms. IV. 83.' [From both of these, if truly the same, Linnaeus takes *Scomber adscensionis* from Osbeck, p. 387, which he united with *glaucus*]. This has been erroneously interpreted by some authors as having made available the name *adscensionis*, which was then cited as *Scomber ascensionis* Bloch & Schneider, 1801 or credited to Forster in the same work.

6. We agree with Wheeler's (1963) conclusion that the name *Scomber glaucus* Linnaeus refers in part to the same taxon as '*Caranx adscensionis* (Osbeck)', but recognition of *glaucus* as the valid name in place of *dentex* Bloch & Schneider would result in considerable confusion and nomenclatural instability. In the 230 years since Linnaeus introduced the name it has never been applied to a species of *Caranx*. Instead, some authors have used the combination *Trachinotus glaucus* (Linnaeus) for the species now widely known as *Trachinotus ovatus* (Linnaeus, 1758) (p. 296; published as *Gasterosteus ovatus*), while others have used it for *Trachinotus goodei* Jordan & Evermann, 1896 (p. 943; described from the 'West Indies, north to west Florida'). The name *ovatus* has been adopted by, for example, Hureau & Monod (1973), Smith-Vaniz & Berry (1978), Smith-Vaniz, Bauchot & Desoutter (1979), Smith-Vaniz (1986b), Smith-Vaniz, Quéro & Desoutter (1990) and Robins et al. (1991a). Wheeler (1991, p. 173, fig. 12) identified specimen ZIU 202 [93] in the Linnaean fish collection in the Zoological Museum of the University of Uppsala as the holotype of *T. ovatus*. We propose that *Scomber glaucus* Linnaeus, 1758 be suppressed and, to avoid uncertainty in the future, that '*Scomber adscensionis* Osbeck, 1771' be placed on the Official Index and *Gasterosteus ovatus* Linnaeus, 1758 on the Official List.

7. *Caranx lugubris* Poey, [1860] (p. 222) (see Norman, 1938, pp. 135–137 for the dates of publication of Poey's works) was described from Cuba and compared to *Caranx ascensionis* Cuvier (authorship credited by Poey to Forster) which Poey wrongly believed to represent a different species. Poey's type specimen (760 mm total length) is probably not extant (it was not listed by Howell-Rivero, 1938). Poey ([1866], p. 328) placed both his own species of [1860], *C. lugubris* and *C. frontalis*, in the synonymy of *ascensionis* and referred to Cuvier (1833, p. 102, pl. 249). Poey

(1875, p. 150) again listed all three names but gave the combination *Carangus lugubris* in bold type, indicating that it was the valid name, and noted that Cuvier's name *C. ascensionis* had been used for a different species (i.e. *dentex* Bloch & Schneider) described earlier by Osbeck. In his discussion of Forster's fish drawings and paintings, Wheeler (1981, p. 791) correctly noted that *Caranx lugubris* Poey, [1860] and *Caranx ascensionis* Cuvier both apply to the same species, the latter name having priority. We know of only three other references in which Cuvier's name has been adopted as the valid name (Cunningham, 1910, pp. 91, 103; Zugmayer, 1911, p. 106; Randall, Smith & Feinberg, 1990, p. 20), the last-mentioned quoting Wheeler as the basis for the usage. Randall, Allen & Steene (1990), however, reverted to the use of *Caranx lugubris*.

8. In their monumental work on the fishes of North and Middle America, Jordan & Evermann (1896, p. 925) treated *Caranx lugubris* Poey, [1860] as valid. Although these authors were aware of the description of *Caranx ascensionis* Cuvier (listing the name as a synonym) they obviously considered it to be an invalid junior secondary homonym in *Caranx*. In their synonymy of *C. lugubris*, Jordan & Evermann began with the following entry: '*Scomber ascensionis*, Bloch & Schneider, Syst. Ichth., 33, 1801; not *Scomber ascensionis* of Osbeck, which may be *Caranx guara*'.

9. The overwhelming majority of subsequent authors have followed Jordan & Evermann (1896) in recognizing *Caranx lugubris* as the valid name. As already noted (para. 1), Osbeck's '*Caranx adscensionis*' is not an available name but it has been used, often spelt '*ascensionis*', and Cuvier's *C. ascensionis* has been treated as a junior homonym. Such widely followed references as the American Fisheries Society's list of common and scientific names of fishes (Robins et al., 1991b and earlier editions), Smith (1965), CLOFAM (Hureau & Monod, 1973, p. 374), FAO species identification sheets (Smith-Vaniz & Berry, 1978; Smith-Vaniz, 1984), Masuda et al. (1984), Smith and Heemstra (1986, p. 647), and Paxton, Hoesé, Allen & Hanley (1989, p. 577) have all adopted *Caranx lugubris*. In a far-from-complete search we found a total of 80 references in which this name was adopted; a list of these references is held by the Commission Secretariat. Smith-Vaniz (1984, 1986a) noted the priority of Cuvier's name, that *C. lugubris* had had much greater usage in both the fishery and taxonomic literature, and that in the interest of nomenclatural uniformity and stability *lugubris* should be retained.

10. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary powers to suppress the following specific names for the purposes of the Principle of Priority but not for those of the Principle of Homonymy:
 - (a) *glaucus* Linnaeus, 1758, as published in the binomen *Scomber glaucus*;
 - (b) *ascensionis* Cuvier in Cuvier & Valenciennes, 1833, as published in the binomen *Caranx ascensionis*;
- (2) to place on the Official List of Generic Names in Zoology the name *Pseudocaranx* Bleeker, 1863 (gender: masculine), type species by monotypy *Scomber dentex* Bloch & Schneider, 1801;
- (3) to place on the Official List of Specific Names in Zoology the following names:
 - (a) *dentex* Bloch & Schneider, 1801, as published in the binomen *Scomber dentex* (specific name of the type species of *Pseudocaranx* Bleeker, 1863);

- (b) *lugubris* Poey, [1860], as published in the binomen *Caranx lugubris*;
- (c) *ovatus* Linnaeus, 1758, as published in the binomen *Gasterosteus ovatus* Linnaeus, 1758;
- (4) to place on the Official Index of Rejected and Invalid Specific Names in Zoology the following names:
 - (a) *glaucus* Linnaeus, 1758, as published in the binomen *Scomber glaucus* and as suppressed in (1)(a) above;
 - (b) *ascensionis* Cuvier in Cuvier & Valenciennes, 1833, as published in the binomen *Caranx ascensionis* and as suppressed in (1)(b) above;
 - (c) *adscensionis* Osbeck, 1771, as published in the binomen *Scomber adscensionis* (an unavailable name).

References

- Albuquerque, R.M. 1954. Peixes de Portugal e ilhas adjacentes. Chavass para a sua determinação. *Portugaliae acta biologica*, (B)5: 1–1167.
- Artdi, P. 1738. *Ichthyologia sive opera omnia de Piscibus ...*, C. Linnaeus (Ed.). 5 parts. Lugduni Batavorum.
- Barnard, K.H. 1927. A monograph of the marine fishes of South Africa. Part 2. *Annals of the South African Museum*, 21(2): 417–1065.
- Blache, J., Cadenat, J. & Stauch, A. 1970. Clés de détermination des poissons de mer signalés dans l'atlantique oriental (entre le 20e parallèle Nord et le 15e parallèle Sud). *Faune Tropicale*, 18: 1–479.
- Blanc, M. & Bauchot, M.L. 1961. Sur quatre genres de Carangidae (Téléostéens Perciformes) de la Côte Occidentale d'Afrique; *Decapterus*, *Caranx*, *Trachurus*, *Surraeus*. *Bulletin du Muséum National d'Histoire Naturelle*, (2)32(6): 484–497.
- Bleeker, P. 1863. Mémoire sur les poissons de la côte de Guinée. *Natuurkundige Verhandelingen van de Hollandsche Maatschappij der Wetenschappen te Haarlem*, (2)18: 1–136.
- Bloch, M.E. & Schneider, J.G. 1801. *Systema ichthyologiae iconibus ex illustratum ...*, vol. 1. lx, 584 pp. Berlin.
- Clark, R.S. 1915. Atlantic fishes of the Scottish National Antarctic Expedition. *Report on the Scientific Results. Scottish National Antarctic Expedition. S.Y. Scotia 1902–1904*, 4(16): 379–401.
- Cunningham, J.T. 1910. On the marine fishes and invertebrates of St. Helena. *Proceedings of the Zoological Society of London*, 1910: 86–131.
- Cuvier, G. & Valenciennes, A. 1833. *Histoire naturelle des poissons*, vol. 9. 512 pp. Paris.
- Edwards, A.J. & Glass, C.W. 1987. The fishes of Saint Helena Island, South Atlantic Ocean. 2. The pelagic fishes. *Journal of Natural History*, 21(6): 1367–1394.
- Fowler, H.W. 1925. Fishes of Guam, Hawaii, Samoa, and Tahiti. *Bulletin of the Bernice P. Bishop Museum*, 22: 1–38.
- Fowler, H.W. 1927. Fishes of the tropical central Pacific. *Bulletin of the Bernice P. Bishop Museum*, 38: 1–32.
- Fowler, H.W. 1928. The fishes of Oceania. *Memoirs of the Bernice P. Bishop Museum*, 10: 1–540.
- Fowler, H.W. 1931. The fishes of Oceania — Supplement 1. *Memoirs of the Bernice P. Bishop Museum*, 11: 313–381.
- Fowler, H.W. 1936. The marine fishes of West Africa based on the collection of the American Museum Congo Expedition, 1909–1915. Part 2. *Bulletin of the American Museum of Natural History*, 70(2): 607–1493.
- Fowler, H.W. 1949. The fishes of Oceania — Supplement 3. *Memoirs of the Bernice P. Bishop Museum*, 12(2): 37–186.
- Fowler, H.W. & Ball, S.C. 1925. Fishes of Hawaii, Johnston Island, and Wake Island. *Bulletin of the Bernice P. Bishop Museum*, 26: 1–31.

- Günther, A.C.L.G. 1860. *Catalogue of the fishes in the British Museum*, vol. 2. 548 pp. British Museum, London.
- Günther, A.C.L.G. 1876. Andrew Garrett's Fische der Südsee. Heft 5. *Journal of the Museum Godeffroy*, 2(11): 129–216.
- Günther, A.C.L.G. 1880. Report on the shore fishes procured during the voyage of H.M.S. *Challenger* in the years 1873–1876. *Report of the Scientific Results of the Voyage of H.M.S. Challenger 1873–76*, Zoology, 1(6): 1–82.
- Gushiken, S. 1983. Revision of the carangid fishes of Japan. *Galaxea*, 2: 135–264.
- Harry, R.R. 1953. Ichthyological field data of Raroia Atoll, Tuamotu Archipelago. *Atoll Research Bulletin*, 18: 1–190.
- Howell y Rivero, L. 1938. List of the fishes, types of Poey, in the Museum of Comparative Zoology. *Bulletin of the Museum of Comparative Zoology* (Harvard University), 82(3): 169–227.
- Hureau, J.C. & Monod, T. (Eds.). 1973. *Check-list of the fishes of the north-eastern Atlantic and of the Mediterranean (CLOFNAME)*, vol. 1. xxii, 683 pp. UNESCO, Paris.
- Jordan, D.S. & Evermann, B.W. 1896. The fishes of North and Middle America: a descriptive catalogue of the species of fish-like vertebrates found in the waters of North America, north of the Isthmus of Panama. Part 1. *Bulletin of the United States National Museum*, 47: 1–1240.
- Linnaeus, C. 1758. *Systema Naturae*. Ed. 10, vol. 1. 824 pp. Salvii, Holmiae.
- Linnaeus, C. 1764. *Museum Sæ Ræ Mitis Adolphi Friderici Regis ... Aves, Amphibia, Pisces describuntur. Tomi Secundi Prodrromus*. 111 pp. Salvii, Holmiae.
- Lozano y Rey, L. 1952. Peces fisoclistos, subserie torácicos. *Memorias de la Real Academia de Ciencias Exactas, Físicas y Naturales de Madrid* (Serie de Ciencias Naturales), 14: 379–705.
- Masuda, H., Amaoka, K., Araga, C., Uyeno, T. & Yoshino, T. (Eds.). 1984. *The fishes of the Japanese Archipelago*. 370 pp. Tokyo.
- Norman, J.R. 1938. Notes on the dates etc. of the 'Memorias', 'Repertorio', 'Synopsis' and 'Enumeratorio' of Felipe Poey. *Journal of the Society for the Bibliography of Natural History*, 1(5): 135–137.
- Osbeck, P. 1757. *Dagbok öfver en Ostindisk Resa åren 1750, 1751, 1752 ...* [6], 376. [16] pp. Stockholm.
- Osbeck, P. 1765. *Reisenach Ostindien und China*, Ed. 2. xxiv, 552 pp., 13 pls. Rostock. [A translation by J.G. Georgi from the 1757 Swedish work].
- Osbeck, P. 1771. *A voyage to China and the East Indies*, vol. 2. 147 pp. London. [Translated by J.R. Forster from the 1765 German version].
- Paxton, J.R., Hoesel, D.F., Allen, G.R. & Hanley, J.E. 1989. *Zoological catalogue of Australia*, vol. 7 (Pisces. Petromyzontidae to Carangidae). 665 pp. Australian Government Publishing Service, Canberra.
- Poey, F. [1860], [1861]. Poissons de Cuba. Pp. 115–336 [1860], 337–356 [1861] in: *Memorias sobre la historia natural de la Isla de Cuba, acompañadas de sumarios Latinos y extractos en Francés*, vol. 2. Habana.
- Poey, F. [1866]. Revista de los tipos Cuvierianos y Valenciennianos correspondientes á los Peces de la isla de Cuba. Pp. 308–338 in: *Repertorio Físico-natural de la Isla de Cuba*, vol. 1. Habana.
- Poey, F. 1875. Enumeratio Piscium Cubensium. *Anales de la Sociedad Española de Historia Natural*, 4(1): 75–161.
- Randall, J.E., Allen, G.R. & Steene, R.C. 1990. *Fishes of the Great Barrier Reef and Coral Sea*. xx, 507 pp., 7 pls., 1314 figs. University of Hawaii Press, Honolulu.
- Randall, J.E., Smith, C.L. & Feinberg, M.N. 1990. Report on fish collections from Rapa, French Polynesia. *American Museum Novitates*, 2966: 1–44.
- Robins, C.R., Bailey, R.M., Bond, C.E., Brooker, J.R., Lachner, E.A., Lea, R.N. & Scott, W.B. 1991a. World fishes important to North Americans. *American Fisheries Society. Special Publication*, 21: 1–243.
- Robins, C.R., Bailey, R.M., Bond, C.E., Brooker, J.R., Lachner, E.A., Lea, R.N. & Scott, W.B. 1991b. A list of common and scientific names of fishes from the United States and Canada, Ed. 5. *American Fisheries Society. Special Publication*, 20: 1–183.

- Schultz, L.P. 1943. Fishes of the Phoenix and Samoan Islands collected in 1939 during the expedition of the U.S.S. *Bushnell*. *Bulletin of the United States National Museum*, 180: 1–316.
- Seale, A. 1901. Report of a mission to Guam. Part 2 — Fishes. *Occasional Papers of the Bernice P. Bishop Museum*, 1(3): 61–128.
- Seki, M.P. 1984. The food and feeding habits of the white trevally, *Pseudocaranx dentex* (Bloch and Schneider 1801), in the northwestern Hawaiian Islands. Pp. 192–208 in Grigg, R.W. & Tanoue, K.Y. (Eds.), *Proceedings of the Second Symposium on Resource Investigations in the northwestern Hawaiian Islands*, vol. 2. University of Hawaii Sea Grant College Program, Honolulu.
- Smith, J.L.B. 1965. *The sea fishes of Southern Africa*. 580 pp. Cape Town.
- Smith, J.L.B. & Smith, M.M. 1966. *Fishes of the Tsitsikama Coastal National Park*. 161 pp. Johannesburg.
- Smith, M.M. & Heemstra, P.C. (Eds.). 1986. *Smiths' sea fishes*. xx, 1047 pp., 144 pls., text figs. Macmillan South Africa, Johannesburg.
- Smith-Vaniz, W.F. 1984. Carangidae. In Fischer, W. & Bianchi, G. (Eds.), *FAO species identification sheets for fishery purposes. Western Indian Ocean (Fishing Area 51)*, vol. 1. Food and Agricultural Organization of the United Nations, Rome.
- Smith-Vaniz, W.F. 1986a. Carangidae. Pp. 638–661 in Smith, M.M. & Heemstra, P.C. (Eds.), *Smiths' sea fishes*. xx, 1047 pp., 144 pls., text figs. Macmillan South Africa, Johannesburg.
- Smith-Vaniz, W.F. 1986b. Carangidae. Pp. 815–844 in Whitehead, P.J.P., Bauchot, M.-L., Hureau, J.-C., Nielsen, J. & Tortonese, E. (Eds.), *Fishes of the North-eastern Atlantic and the Mediterranean*, vol. 2. UNESCO, Paris.
- Smith-Vaniz, W.F., Bauchot, M.L. & Desoutter, M. 1979. Catalogue critiques des types de poissons du Muséum National d'Histoire Naturelle (suite). Familles des Carangidae et des Nematistidae. *Bulletin Muséum National d'Histoire Naturelle*, Section A (Zoologie), (4)1, Supplément 2: 1–66.
- Smith-Vaniz, W.F. & Berry, F.H. 1978. Carangidae. In Fischer, W., Bianchi, G. & Scott, W.B. (Eds.), *FAO species identification sheets, eastern central Atlantic*, vol. 1. Food and Agricultural Organization of the United Nations, Rome.
- Smith-Vaniz, W.F., Quéro, J.C. & Desoutter, M. 1990. Carangidae. Pp. 729–755 in Quéro, J.C., Hureau, J.-C., Karrer, C., Post, A. & Saldanha, L. (Eds.), *Check-list of the fishes of the eastern tropical Atlantic*, vol. 2. JNICT, Portugal.
- Streets, T.H. 1877. Contributions to the natural history of the Hawaiian and Fanning Islands and Lower California. *Bulletin of the United States National Museum*, 7: 1–172.
- Wheeler, A. 1963. The nomenclature of the European fishes of the subfamily Trachinotinae. *Annals and Magazine of Natural History*, (13)5(57): 529–540.
- Wheeler, A. 1881. The Forsters' fishes. Pp. 781–806 in James Cook, *The Journal of H.M.S. Resolution 1772–1775*. Genesis Publications, Guildford.
- Wheeler, A. 1991. The Linnaean fish collection in the Zoological Museum of the University of Uppsala. *Zoological Journal of the Linnean Society*, 103: 145–195.
- Yamaoka, K., Han, H.-S. & Taniguchi, N. 1992. Genetic dimorphism in *Pseudocaranx dentex* from Tosa Bay, Japan. *Nippon Suisan Gakkaishi*, 58(1): 39–44.
- Zugmayer, E. 1911. Poissons provenant des campagnes du Yacht *Princesse-Alice* (1901–1910). *Résultats des Campagnes Scientifiques accomplies sur son yacht par Prince Albert 1er*, 35: 1–174.